What is claimed is:

1. An illuminator device for an optical image processing system, wherein the image processing system comprises an optical system requiring partially coherent illumination, and where the illuminator comprises:

a source of coherent or partially coherent radiation which has an intrinsic coherence that is higher than the desired coherence;

a reflective surface that receives incident radiation from said source;

means for moving the reflective surface through a desired range of angles in two dimensions wherein the rate of the motion is fast relative to integration time of said image processing system; and

a condenser optic that re-images the moving reflective surface to the entrance plane of said image processing system, thereby, making the illumination spot in said entrance plane essentially stationary.

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2. The illuminator of claim 1 wherein the means for moving the reflective surface moves through the entire desired range of angles at least once during the integration time of the image processing system.

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3. The illuminator of claim 1 wherein the source of partially coherent radiation comprises a synchrotron source.

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4. The illuminator of claim 1 wherein the source of partially coherent radiation comprises an undulator source.

The illuminator of claim 1 wherein the reflective surface comprises a flat

mirror.

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6. The illuminator of claim 3 wherein the reflective surface comprises a multilayer-coated flat mirror.

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- 7. The illuminator of claim 4 wherein the reflective surface comprises a multilayer-coated flat mirror.
- 8. The illuminator of claim 1 wherein the condenser optic is a single reflective element.
 - 9. The illuminator of claim 8 wherein the reflective condenser element is spherical.
- 10. The illuminator of claim 3 wherein the condenser optic is a single reflective multilayer-coated element.
 - 11. The illuminator of claim 10 wherein the reflective multilayer-condenser element is spherical.
 - 12. The illuminator of claim 4 wherein the condenser optic is a single reflective multilayer-coated element.
- 13. The illuminator of claim 12 wherein the reflective multilayer-condenser element is spherical.
 - 14. The illuminator of claim 1 wherein the means for moving the reflective surface comprises tilting the optic in two dimensions.
- 15. A method of modifying the coherence of a beam of radiation from an undulator source that comprises:
 - (a) directing the beam of radiation into a reflective surface;
 - (b) moving the reflective surface through a desired range of angles in two dimensions wherein the rate of the motion is fast relative to the subsequent observation time; and

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- (c) re-imaging the moving reflective surface to an observation plane, thereby, making the illumination spot in said observation plane essentially stationary.
- 5 16. The method of claim 15 wherein step c comprises moving the reflective surface through the entire desired range of angles at least once during the integration time of the image processing system.
- 17. The method of claim 15 wherein the source of partially coherent radiation comprises a synchrotron source.
 - 18. The method of claim 15 wherein the source of partially coherent radiation comprises an undulator source.
- 15 19. The method of claim 15 wherein the reflective surface comprises a flat mirror.
 - 20. The method of claim 17 wherein the reflective surface comprises a multilayer-coated flat mirror.
 - 21. The method of claim 18 wherein the reflective surface comprises a multilayer-coated flat mirror.
 - 22. The method of claim 15 wherein step c employs a condenser optic that has a single reflective element.
 - 23. The method of claim 22 wherein the reflective condenser element is spherical.

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- 24. The method of claim 17 wherein the condenser optic is a single reflective multilayer-coated element.
- 25. The method of claim 24 wherein the reflective multilayer-condenser element is spherical.
 - 26. The method of claim 18 wherein the condenser optic is a single reflective multilayer-coated element.
- 10 27. The method of claim 26 wherein the reflective multilayer-condenser element is spherical.
 - 28. The method of claim 15 wherein step b comprises moving the reflective surface comprises tilting the optic in two dimensions.